THE
OPTICAL
MAGIC
LANTERN
JOURNAL
AND
PHOTOGRAPHIC
ENLARGER.
EDITED BY J. HAY TAYLOR.
A MAGAZINE OF POPULAR SCIENCE FOR THE LECTURE-ROOM AND THE DOMESTIC CIRCLE.
Entered at Stationers' Hall
1889

WITH WHICH IS INCORPORATED THE "LANTERN WORLD."

Vol. 8.—No. 93. FEBRUARY, 1897. DOUBLE NUMBER, *Price* 2d., *Post-free* 3½d.

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## NOTICES.

The *Optical Magic Lantern Journal and Photographic Enlarger* is issued on the 1st of every month, price One Penny, and may be obtained from all Newsvendors, Railway News Stalls, Photographic Dealers, or from the Publishers, at the following rates, post free:—

| | | United States. |
|---|---|---|
| 12 months, including double numbers | 2/6 | 75 cents. |
| Single copies | 2½d. | 8 ,, |

**Exchange** Column, General Wants, &c. (not Trade)—First 20 words, 6d.; and for every 3 additional words, 1d.

**Small Advertisements** must reach the office not later than the first post on the 24th of each month. All cheques and postal orders to be made payable to the Magic Lantern Journal Company, Limited.

**Editorial** communications must be addressed, J. HAY TAYLOR. Advertisements and business communications to the **Magic Lantern Journal Company, Limited 9, Carthusian Street, London, E.C.**

American Agents:—The International News Co., 83 and 85, Duane Street, New York City.

## NOTES.

**A Lighthouse Overturned.**—The "Alligator," a Glasgow mail steamer, lately collided with a lighthouse in Belfast Bough overturning it, and casting the keeper and his wife to the mercy of the waves; they were fortunately able to cling to some wreckage, and were eventually rescued by a passing steamer.

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**Ozone and Oxygen Generators.**—A new ozone and oxygen generator has just been introduced by the Paris Academy of Science. It consists of a glass tube containing seven narrow tubes, each of which has a spiral of aluminium wire inside and outside, which are connected with the two poles of an induction coil. These generators, in operating with air, produce as much as 170 milligrammes of ozone and 235 of oxygen.

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**Five Feet of Gas in One's Waistcoat Pocket.**—According to the writer of an article in one of our daily papers, he asserts that 5 feet of acetylene can be carried in one's waistcoat pocket, and that the only thing that will set it alight is water. It is quite evident that the writer in question is lacking in experience.

**Acetylene for General Illumination.**—There are rumours to the effect that a company is about to take in hand the general supplying of acetylene gas to houses round about London, as soon as the insurance conditions are modified.

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**Lectures on the Röntgen Rays.**—The subject of the Röntgen rays has been discoursed upon in most of the towns of any importance during the past year. As far north as the Orkney Islands, a photograph of a hand taken by these rays, was, within a few days of the publication of the invention, in the possession of a gentleman in the town of Stromness; and in this same town an interesting lecture, including the history of photography, was recently given by Mr. J. R. Black, photographer, under the auspices of the United Presbyterian Guild, at which many X ray pictures were projected by means of the lantern before a large audience. Practical demonstrations by the X rays and animated photographs were given on the 18th ult., at Orphir, six miles from Stromness, by Dr. Wolfenden, who prefixed the demonstration by historical accounts of these inventions.

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**Lantern Slide Bureau.**—A bureau for the interchange and hiring of lantern slides has been established under the managership of Mr. S. White, at 153, Turner's Road, Bow, E. Each member is to contribute 36 slides, or £2 2s. to be expended in slides, which shall remain his property. Any of the slides in hand may be hired by members at a nominal rate. We understand that at present 792 slides are available.

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**Kodak in the Dictionary.**—According to a new dictionary published in the United States, the word kodak is treated as a trans. verb, meaning "to take an instantaneous picture of."

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**House Gas and Rubber Tubing.**—Some experiments conducted with coal gas and rubber tubing demonstrated the fact that the purer the rubber tubing the more gas it absorbs, and that which absorbs the least, and consequently gives off least smell, is that known as grey rubber, which contains about fifty per cent. of solid matter.

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**Acetylene for Motor Cars.**—Recent experiments have shown that acetylene gas is admirably suited for use in motors, and it is claimed that a motor tricycle can with it be run at the cost of a halfpenny per hour.

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**A Resumé of the Past Year.**—At Lowestoft it is the custom of the Rev. J. M. Hamilton to give, in each January, an illustrated lecture on the chief events of the past year. The subjects this year included sets of slides of the X rays, Dr. Jim's ride, Dr. Nansen's voyage, massacres of the Armenians, and many others of interest. These annual lectures are given in connection with the London Road Baptist Chapel.

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**Old Belfast.**—One of the most interesting lectures yet given before the Belfast Young Ireland Society was on "Old Belfast," by Mr. John Marshall of that city, assisted at the lantern by Mr. J. Allen. The suggestion for the lecture came originally from Mr. Allen, but the research and putting together of the facts was solely the work of Mr. Marshall, who as a student of Irish history and an antiquarian has few equals. The great interest the audience took in this lecture was at once apparent, and the lecturer kept them interested with the history of the growth of their town. Beginning with illustrations of old maps of four hundred years ago, he proceeded step by step up to the present period. Such a great interest has been taken in this paper that some of the Irish papers have reproduced the entire lecture.

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**Kromskop.**—The Kromskop is the new name given to Mr. Ives' instrument for showing photographs in their natural colours, a lecture and demonstration in connection with which was given by the inventor in the first week of last month at St. George's Gallery, Grafton Street, Bond Street. The pictures are taken in triplicate through coloured media, as mentioned in former numbers of this journal.

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**Motophotoscope.**—A new machine for projecting animated photographs on the screen has just been brought out by Mr. W. C. Hughes. This instrument is not provided with any shutter for cutting off the light during the changing of each picture. We intend seeing it in operation shortly, when it will be noticed in our columns.

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**Gases in Coal Mines.**—At a lecture last month at Prestonpans, held at the Free Church Hall, Professor Haldans explained by means of illustrations projected with the lantern, how many lives might be saved in cases of explosions or fires in the working of mines.

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**Annual Supper and Concert.**—The annual supper of the employés of Messrs. W. Butcher & Son, Blackheath, took place at the "Princess of

Wales" Hotel, on 14th ult. After the supper a smoking concert was given, when a long and excellent programme was successfully carried through. During the evening the toast of "Prosperity to the Firm" was proposed, amidst much applause and musical honours, which was responded to by Mr. Frank Butcher.

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**To Ascertain the Focus of a Lens.**—A ready means of ascertaining this is as follows: Fasten a small sheet of white paper on the wall, say immediately opposite a window in a room, then hold the lens in front of this, front lens towards the window, and move backwards or forwards until a sharp image is seen on the paper of chimney pots or other objects in the distance. When the image is sharp, measure the distance from the sheet of paper to a point midway between the front and back combinations of the lens. Supposing this to measure eight inches, eight inches will be the equivalent focus of the lens.

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**Change of Proprietorship.**—The business of D. Noakes & Son, of Greenwich, has been taken over by Mr. G. P. Norman (who has for many years been connected with Messrs. Watson & Son, of Holborn). We understand that Mr. D. W. Noakes will, however, continue to give his practical experience as hitherto, and that the firm in future will be known as Noakes & Norman.

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**History of Cinematographs.**—On the 7th ult., an instructive paper was read by Mr. W. J. Coles, on the "History and Development of the Cinematograph," at the Camera Club, Charing Cross Road, W. After the reading a practical demonstration was given by means of Messrs. Wrench's machine, which was considered practically noiseless and steady. It was found that a good powerful limelight jet was sufficient for all ordinary purposes. The jet selected was Locke's patent high-power mixed-gas get, which has already achieved a most marked success. In the practical test it was found not very far behind the electric arc lamp, which was afterwards used for the sake of comparison.

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**X Ray Paper.**—In another column mention is made of a paper brought out by The Eastman Photographic Materials Company, on which radiagraphs may be obtained instead of on glass as formerly practised.

**The Aintree Institute.**—This institute, built last year by Mr. W. P. Hartley at a cost of over £8,000, has recently been presented by its generous founder with a magnificent lantern. The instrument, which is a special "Ideal" supplied by Messrs. Archer & Sons, of Liverpool, was used on the 15th ulto. to illustrate a lecture given by Mr. William Lockier, of the Aintree Photographic Society, on "A Cruise on the Fjords of Norway," when its effective working was all that could be desired. Mr. Thos. W. Brooks, a member of the Institute Council, has been appointed lanternist.

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**Albert Hall.**—At the time of Dr. Barnardo's children's entertainment at the Royal Albert Hall, the lantern contributed to no small extent to their enjoyment. Illustrations of the homes, inmates, practical results, and working of the homes were projected by Mr. D. Noakes on a 42 feet screen at long range. The light was excellent, and speaks much for "Noakes' special mixed," which was the form of jet used. We understand that Mr. C. W. Locke is again engaged at the Royal Albert Hall, Kensington, on behalf of the Royal Geographical Society, for the purpose of illustrating Dr. Nansen's Arctic lecture. Mr. Locke will use the same powerful apparatus and jets as on his last occasion. The screen to be used is 37 feet 6 inches square, and the distance 166 feet 6 inches, giving a 35 feet disc.

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**Exhibition — Photographic Society of Ireland.**—On the 8th to 13th inst., will be held the annual exhibition in connection with the Photographic Society of Ireland. There will be an open class competition for gold, silver, and bronze medals, full particulars respecting which may be obtained from the Hon. Sec., Mr. Victor E. Smyth, 35, Dawson Street, Dublin.

In our November journal we had the pleasure of recording the marriage of Miss Florence Adelaide Kœnig (daughter of Prof. Kœnig) to Mr. H. J. Hill (son of the well-known slide artist, Mr. W. R. Hill). It is now our painful duty to record the death of the bride of only a few months. Mrs. Hill caught a severe cold, from the effects of which she died (December 18th) after a week's illness. We tender our deepest sympathies to Mr. Kœnig, Mr. W. R. Hill, and Mr. H. J. Hill; and feel assured that we are also expressing the sentiments of those of our readers to whom they are well-known either in a business or friendly sense.

## *Acetylene Gas and Insurance.*

MANY fire insurance companies have lately made a "stand" against insuring premises in which acetylene gas has been used, but now certain conditions have been imposed by them. These are to the effect that all apparatus and ingredients for the generation of acetylene must be in a building at least ten feet distant from any other; that suitable valves for controlling the pressure be placed inside of this detached building, and that on the piping (outside) connecting the detached building with the premises to be illuminated, a cut-off tap must be placed where it is easy of access. Also that there must be some automatic device in connection with the piping in the building to be illuminated, so that should the acetylene gas exceed a certain pressure to the square inch, that the excess will, by means of an exit pipe, be allowed to escape into the open air.

These conditions will appear very stringent to those who have had experience with acetylene gas, but we have no doubt that "vested interests" have much to do with the opposition that is met with in connection with the introduction of this valuable illuminant. Time, however, will level matters.

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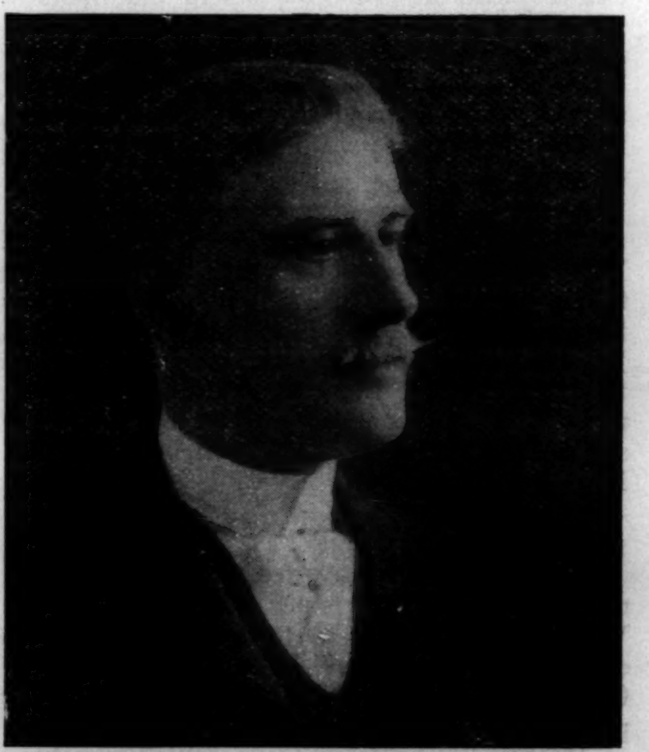
## Prominent Men in the Lantern World.

### No. IV.—Mr. W. C. HUGHES.

THERE is only one "Hughes" who takes a foremost part in the world of lantern projection, and that is Mr. W. C. Hughes, of Brewster House, Mortimer Road, Kingsland, N. Before taking up the science of optical projection, Mr. Hughes had a diversity of experiences, and before settling down in this line he had a varied career; he ventured on the stage both in the capacity of an amateur and professional, and from what the critics have said, he might have done great things in that direction. Extracts from two well-known journals, among a number of others, will suffice, viz. (*Court Circular*): "Considering that Mr. Hughes kept a very large audience delighted and amused for nearly three hours with dramatic readings, humorous songs, and a full programme of magic and mystery, that simple statement would alone stamp him as possessing dramatic and entertaining powers of no mean order." (*Pictorial World*): "If Mr. Hughes had not already made a name as a scientist, he would have little difficulty in making a reputation as an entertainer." Eventually he relinquished this, and established himself as a chemist and dentist. He also intended entering the medical profession for which he partially qualified, but being very sensitive the operating theatre had no charms for him; but optical projection, and the necessary apparatus with which to achieve best results, became pet subjects with Mr. Hughes, and the result of a few minor inventions of his in connection with this science found him rapidly becoming popular in that line, which was then, from a hobby, introduced into his business. Finding himself in the very rut for which he was intended, he put all his energies in this direction, and novelty upon novelty was introduced by him in such a practical and workmanlike manner that it was impossible that he could do otherwise than fall into the foremost ranks at an early period, at which time the other departments of the business were discontinued.



1895.

It is quite needless to say that the single, bi-unial, and triple lanterns, which are made and supplied by Mr. Hughes, are of high quality and finish, and that his slides are coloured with exquisite taste, for this was his intention when first he started, and it has ever since been such, and his twenty-six years of experience as a scientist, inventor, and manufacturer, have placed him in a position which may well be the envy of many.

Intending purchasers, or for that matter anyone interested, are always sure to get a welcome at his show rooms and slide gallery, and when they have seen all that is there to be seen, and examined some of the scientific adjuncts introduced they will probably be surprised to see the high status to which the lantern has risen.

The portrait of our sketch would almost suggest that he were a man of about forty years of age, instead of the fifty-three years which have passed over his head, but then Mr. Hughes is in spirits quite a young man, and doubtless his general good nature has much to do with his affable and contented look, and altogether he is certainly a versatile all-round man.

We find that nearly twenty patents have been granted him for improvements which were much appreciated, but unfortunately the introduction of the cheap commercial apparatus has to a certain extent spoiled the taste of the masses, but among those who may be classed among his *clièntele* are Madame Patti, who has a magnificent outfit in her theatre, Craig Castle, Professor Malden, the late Marajah of Mysore, Captain Selwyn, Mr. Saul Carpenter, Captain Chas. Reade, R.N., Canon Scott, The Royal Polytechnic, etc.

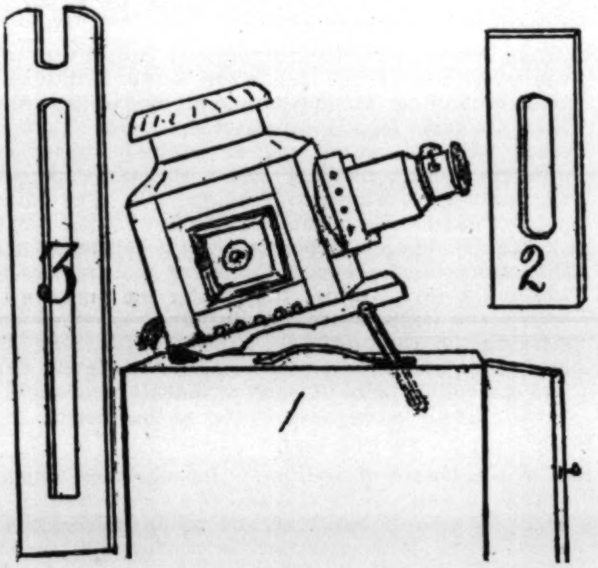
## *Lantern Tilting Arrangements.*

### By GEORGE KILBURN.

OWING to the structural arrangement of nearly all our public halls and institutions in which lanternists have to operate, many makeshifts and dodges are resorted to for the purpose of projecting the pictures on to the proper part of the sheet. In most places the lantern has to be fixed much below the centre of screen, and if the lantern or lantern box is not fitted with a tilting arrangement, then the tact of the lanternist is put to the test, as to how he can best accomplish what is required, under the circumstances, to elevate his lantern so as to project the pictures on to the right place on the screen.

Some of the lanterns now on the market are so fitted that the pictures can easily be projected to almost any part of a room. My lantern being one of those without any fittings for raising the lantern, I decided on adding a simple device of my own, to enable the lantern to be raised easily and quickly, and at a small cost. The only accessories needed are four milled screws with plug-nuts, two slotted struts (3), and two slotted plates (2) as shown in drawing.

The screws with plugs cost 4d. each, if not larger than $\frac{5}{8}$ inch diameter, the struts from 10d. per pair, and slotted plates 4d. per pair. Having procured the fittings mentioned, fit two of the plug-nuts in the front part of the baseboard of the lantern, as shown, one on either side. Next, fix lantern on top of box, and cut two slots for struts to go through a little in advance of the screws in baseboard, fit in the slotted plates, which will prevent the holes from wearing too large. Then fix two plug-nuts inside of box to hold the struts at whatever height they are required. If the box is wider than the lantern, screw on a block of wood at each side to hold the plug-nuts and screws. If the lantern is fitted with a plate on front of baseboard to prevent it from slipping, it can be taken off and put on the back part. To use this arrangement, push up the slotted struts, and clamp them to baseboard, then tilt the lantern as high as is necessary, and tighten screws inside box (1). After use, loosen all the screws, when the struts will drop inside of box out of the way, which is much better than having any projections outside of box when carrying from place to place. A tilting device like this is much better than using wedges of wood, or hunting up any old books with which to prop up the lantern, and is far safer and more expeditious.



# *The Lanternist's Practical Cyclopædia.**—*No. IV.*

### By CHARLES E. RENDLE.

**Blow-Through Jet.**—A jet of absolute safety, so constructed that a stream of oxygen passes through a flame of coal-gas, oxyhydrogen impinging on the lime cone.—*See* Blow-pipe.

**Blow-Pipe.**—A small instrument for directing a blast of air or other gas through a flame for the purpose of raising the temperature. The blow-through jet is but a double-tubed blow-pipe, where the combustible gas is directed through the outer tube, whilst the oxygen is blown through the flame from an inner tube.

**Blow-Pipe Analysis.**—A method in chemistry for the determination of the composition of minerals by the aid of the blow-pipe.

**Blue Vitriol.**—Sometimes called blue stone. Sulphate of copper.

**Body of Lantern.** — The main casing to which the various accessories are affixed.

**Boiling Point.**—The boiling points of liquids vary with the properties of the substance, some of the most volatile boiling at low temperatures, whilst others boil at very high temperatures. For example, ether will boil at 35° C. at normal atmospheric pressure, whilst mercury under the same pressure neccessitates a temperature of 350° C. The boiling point of water under normal conditions would be 100° C., or 212° F., but as the boiling point is dependent upon the atmospheric pressure, the lesser the pressure the lesser the temperature, the greater the pressure the higher the temperature. So it may be assumed (considering the approximation to be 1° C. for every 1,000 feet one rises), that ascending a mountain 6,000 feet the boiling point of water at that attitude would be 94° C., the air being much lighter at that height.

**Bone Black.**—*See* Charcoal.

**Borax.**—A borate of sodium. Its substance, which is soluble in water, is whitish and of a sweetish taste. It is largely used in medicine, and as an uniting flux in metallurgy. It is also used in photography, and in chemical analysis it is invaluable as a determining flux for certain metals, which becoming heated with it show out small globules of various beautiful colours. In addition to the above, borax is employed as a cleansing agent in many forms.

**Brass.**—An alloy of copper and zinc.—*See* Copper.

**Brass Lacquer.**—A varnish for metals, generally prepared by dissolving shellac in alcohol, when a colouring matter is added. A useful lacquer may be made by dissolving one ounce of shellac in twenty ounces of alcohol, to which add quarter of an ounce of dragon's blood and about forty grains of turmeric root. If this be stored in a well-stoppered bottle it will keep for an indefinite period. When an article is to be lacquered it should be warmed to about 120° F., when the solution may be applied with a broad lacquering brush.

**Bromides.**—The compounds of bromine with the metals are termed *bromides*.

**Bronze.**—A tin and copper alloy, sometimes also containing zinc, iron, or lead in small quantities. Bronze is harder than copper, more fusible, and may be rendered workable by frequent annealing, which is most effectively done by heating to a high temperature (dull redness), and suddenly cooled by plunging in cold water. If allowed to cool gradually it becomes hard and brittle, and in this particular is just the opposite to steel.

**Bunser Burner.**—The common atmospheric burner in general use. Air is allowed to mix with the gas some distance from the point of ignition, rendering the flame smokeless and non-luminous. The advantages are principally greater heating power and economy. To one volume of gas consumed, about two volumes of air are used up in feeding the flame as fuel

**Burners for Lanterns.** — *See* Oxy-calcium Spirit Jet, Blow-through Jet, Combination Jet, etc., etc.

**Cadency.**—In rhetoric, the falling of the voice. Both in ordinary reading or speaking, the pitch of tone is termed the key-note, and by dropping the voice below that pitch is cadence.—*See* Elocution.

**Cadmium.**—Many of the zinc ores contain traces of cadmium. It is a whitish metal much resembling tin in its properties and appearance, and although very malleable is tougher. Cadmia is a sulphide of cadmium.

**Calcium.**—The metallic base of lime, a very light metal, one part being equal to one and a half parts of water. Yellow in colour, exceptionally ductile, so much so that it may be cut with a knife, or beaten out as thin as gold-leaf, its chief compounds being the oxide, the carbonate and the sulphate.

**Calcic.**—Being in part calcium, containing calcium.

**Calotype.**—A name given to a photographic process in 1840 by its inventor Henry Fox Talbot, and by its means pictures of natural objects and other things were obtained by the action of light upon nitrate of silver. The Calotype, however, like its predecessor the Daguerreotype, has long since been superseded by other photographic improved advances.

**Camera.**—The light-tight box or cabinet, containing an aperture or passage for the admission of light, and into this gap is fixed the lens which can be opened and closed at will. There are many varieties of cameras, but the principle in all is the same as it was fifty years ago. The earliest was what is known as the old box pattern, consisting of one box working or sliding within another. Many of the original form are still about, and may frequently be seen in second-hand shop windows, or at sea-side resorts in summer time, and strange to say, it was some fifteen years before any departure was made in the pattern. The flexible body, or leather bellows was then introduced, and at once became popular in consequence of its light and portable nature, and although it is just over forty years ago since that change, it is with us to-day, and will remain without doubt practically unaltered through some generations. With the introduction of the bellows body, other inventions followed, some excellent, some useless. The rising front and swing-back attachments are strongly recommended, and all cameras to turn out good work should be fitted with these two at least. Of hand cameras (which by the way have proved a boon to the tourist and lanternist alike) much might be written; they are all more or less complicated in their automatic working, and the simplest that can be found is the best, which ever that may be out of such an endless variety. Negatives may be made on glass, celluloid films, or rolls of films, according to the make of camera. To the tourist, or perhaps cyclist, who has to carry a camera of any dimensions, the celluloid films should be a great advantage when the difference in weight between glass and celluloid is considered.

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**Camera Obscura.**—An optical instrument so constructed that real images of external objects may be thrown upon a screen by the aid of a convex lens. There are several forms of camera obscura, both for single and double reflection, one of these being the ordinary photographic camera. A simple form of instrument can be made from a common cigar box, by cutting a hole at one end to receive the lens mount, which for focusing purposes is made to slide in and out. At the other end of the box, but inside, is placed a mirror at an angle of 45°, and immediately above this is fixed a pane of ground glass cut same size as mirror, and when in position lays in the rabbet that receives the lid; part of the lid is cut away, that the whole is flush. The light may be shielded from the focusing glass by any devisable means. To ensure regular reflection the box is blackened inside.

**Camera Club.**—A term given to a society by its members, whose object is to come into touch with one another, and exchange, or debate, any subject matter appertaining to photography.

**Camera Stand.**—The table upon which a camera is held or fixed.

**Canada Balsam.**—Largely used for cementing glass, lenses, microscopic objects, and many other articles. It is one of the turpentine species, and obtained from the Canadian coniferous tree, from whence it takes its name. By gentle heat it becomes very thin, but when set or cold, is both hard and transparent.

(*To be continued.*)

## *Architecture as a Subject for Lantern Slides.—No. IV.*

**By T. PERKINS.**

### Practical Hints on Procedure. Principally Interior.

HAVING provided ourselves with all the necessary apparatus as described in the last chapter, we will choose a suitable day for commencing actual work. And here let me say that we need not fancy that architectural work, interior or exterior, is only possible in the summer months. Summer and winter have their advantages and disadvantages. In summer the light is stronger and exposures will consequently be less, and for very dark interiors this will be a great advantage; and again in the early summer morning and late summer evening the sun shines on the north side of churches that are built east and west, and allows well-lighted views of certain parts of the exterior to be obtained, which cannot be as well taken in the winter. On the other hand, the lower elevation of the winter mid-day sun is often an advantage, as it makes the shadows under projecting parapets or canopies less, and lights up the interiors of south porches and doorways, and the absence of foliage on the trees that grow in churchyards or cathedral closes, often makes it easier to get uninterrupted views of the building, or views unspoilt by the heavy shadows of unseen trees falling upon the walls. Again, at no time of the year are inner roofs or ceilings so well lighted as when the ground outside is covered with snow on which the sun is shining, for the sunlight reflected, or scattered, to use the more accurate term, from the surface of the snow-covered ground passing upwards through the windows lights up the dark rafters which support the roof.

That it is possible to obtain good interiors late in the year is shown by the fact that towards the end of November, 1896, I had occasion to go to Christchurch Priory, Hants, for interior work. I arrived at my destination about half-past ten in the morning, and left a little before three o'clock in the afternoon, and during that time had exposed ten plates, all half-plate size, using one camera only.

**The shortest exposure**

was one of five seconds with stop $\frac{f}{28}$, and the longest twenty minutes with stop $\frac{f}{32}$; on my return I found that all of the plates had received sufficient exposures, two of them, in fact, would have been all the better if they had had shorter exposures. I may add that I was using Imperial ordinary plates marked with a speed number of 110. The building was what would probably be called a fairly lighted interior. A friend, who accompanied me, was under the impression that all my pictures would be ruined by under-exposure, because it was towards the end of November, and he gave his plates much longer exposures, with the result that more than half were of no use. I have often had it said to me, "You know you cannot over-expose an interior;" but from my experience, which has been tolerably extensive, I have found that one can as easily over-expose inside a building as outside. Of course, both for exteriors and interiors, it is better to over than under-expose, as though the result may be a flat negative, yet by a judicious selection of printing paper, a bright print, and one full of detail, may be obtained, whereas, if the negative is so much under-exposed that the light proceeding from the darker parts of the subject has made no impression on the film, no amount of accelerator in the developer will bring out detail, and in the print the shadows will be a mass of black or brown. Still, great care must be exercised to get a correctly exposed picture.

(*To be continued.*)

## *Slides.—No. IV.*

By F. J. SCRIMGEOUR.

BEFORE I pass on to the amateur's process, namely, slide-making on gelatino-chloride plates, I must say a few words about the large class of slides which go under the general term of "transfers."

This is a purely commercial and mechanical process, and the results are the very cheapest coloured transparencies in the market. They are also the crudest. These chromo-lithographic lantern slides (which is the proper family name) dress themselves in garments of the loudest pattern, and just because the colours do not usually form a tasteful combination you get very full weight for your money. "Folk can't very well complain about the quality if we give them quantity" is the view they take, and I regret to think that the German tradesmen have very accurately gauged the artistic taste of the British lanternist, as he is found in many parts of Great Britain.

On that never-to-be-forgotten Christmas morning when I had removed the lid from the wooden box which, from its position, I presumed had arrived by way of the chimney, I discovered in a drawer at the side of my first magic lantern a parcel of slides each about a foot long.

On these stripes of glass the "king of the forest" could be seen fleeing for dear life from the angry onrush of a huge black-beetle, while a little push displayed the hairy form of a gorilla hanging from the tendril of a gooseberry bush laden with large (very large) and rosy (very rosy) American apples. Santa Claus is not without common sense, and he had evidently in his mind when he dropped that box down the chimney, the combination of natural history with amusement. How I loved those pictures! How I adored the fourth slide with the clowns at the beginning, and ending with a nigger drinking from a

**bottle labelled ink.**

The clowns perhaps grew dull, or may be the ink gave out—I do not exactly know the reason why—but the fact remains that as the weeks and months flew on, the nursery exhibitions became less frequent until at last they ceased altogether, and the dust gradually buried from sight the gaily-coloured label on the toy-press shelf.

As I write, I feel quite sure that the finest set of artistically tinted photos could not then have given me half the pleasure I derived from my dozen transfer slides. They are quite suitable for children, and a new box of slides for his last year's lantern, in many cases, proves the most acceptable gift you can give a boy at Christmas.

But the development in the use of these transfer slides has caused me much astonishment. Some dealers now stock large numbers of them in the standard square size, and a glance at a lantern catalogue will show that a set of twelve may be had for about 3s. on almost any subject under the sun.

I have had the pleasure (?) of seeing a good many of these sets.

They have made a lasting impression on me! They also revealed to me how woefully ignorant I was on some matters, and how much I had been deceived in my youth about others. At first I felt inclined to question the truthfulness of some of the pictures, but recently, while glancing over a certain catalogue, I saw these same slides described as "authentic," which statement, of course, settles the matter.

I am now quite aware that all the passengers who take "a voyage across the Atlantic in an Ocean greyhound" have hair of exactly the same "carroty red" colour. A friend of mine says that he expects the salt spray of the "herring pond" turns all the "golden," "auburn," and "raven" tresses into the same sweet tint mentioned above, but for my own part I am inclined to believe that there must be some powerful though private line which only accepts as passengers people whose locks will "match" their standard pattern.

I was also much gratified to see what a healthy life is the life of a whaler, and that each man engaged in the industry possesses such lovely rosy cheeks as might well raise envy in the heart of any actress. The occupation is no doubt a dangerous one, but these men have stout British hearts, and even when death stares them in the face they acquit themselves like men. Do they blanch with terror when a big black tail meets the bottom of their shallow boat? Not at all; the healthy bloom does not desert the cheek even when their bodies are involuntarily rising towards the cloudless heavens.

I have heard that the use of

**chromo-litho slides**

is rapidly increasing in the country villages. According to statistics, insanity is becoming more common in certain rural districts. I don't wonder.

As long as these transparencies are considered and exhibited as comic slides, they do not call for any condemnation, but it is surely much to be regretted that in any part of the kingdom such rubbish should be used to illustrate any serious lecture. In particular, I feel I must refer to the extent to which these crude pictures are used to illustrate Scripture subjects. The lantern has now taken its position as an important Sunday institution, and all over England lantern services are very popular; but it is positively disheartening to those who are endeavouring to raise the status of the average slide, to find in some mission halls large quantities of such gaudy trash in regular use, when it is now possible to procure in a transparent form copies of nearly all of those famous paintings which cannot but touch every human heart. These, I know, are much more expensive to buy, but I also know that for nine-tenths of those Sunday exhibitions the slides are only hired, and so, of course, any difference of cost would be very small.

(*To be continued.*)

## *Lantern Lectures.*

By G. R. BRYCE.

IT is a remarkable fact that although so many lantern lectures are held nowadays, there are, comparatively speaking, very few which come up to the standard which this class of entertainment should hold. In my remarks here, I refer of course to that class of entertainment at which the lantern is used to illustrate the lecturer's discourse, and not to those occasions when it is employed for purely educational or teaching purposes, an exhibition of slides at a photo-club, or a children's "magic lantern show."

The lectures of which the posters announce "to be illustrated by limelight views," or, "by a series of beautiful slides shown by a powerful limelight lantern," etc., etc., are rather commonplace. Nowadays anyone who has a lantern, and a camera wherewith to make slides, or a few shillings to buy them, gives a lecture of the above description. The lantern to all appearances is not declining, but no doubt it would be very much more popular if this inferior kind of exhibition were done away with, and the public had more opportunities of hearing really interesting and pithy lectures.

Let me give an example of an exhibition, for I cannot call it a lecture, which all good lanternists abhor. A lecture was advertised to be upon ———, and as it promised to be rather interesting I resolved to attend. The subject was one which necessitated a comparison, and the lantern was to be used to illustrate the lecture. The comparison part occupied about ten minutes, while the remainder of the lecture (?) was taken up by a show of miscellaneous slides — very good of their kind, except those made by the lecturer—accompanied by no remarks upon the subject, or indeed any at all, to edify an intellectual audience; indeed, as many of the pictures were of a kind to amuse children, the exhibition was one which would have suited better for a juvenile entertainment. When one attends a lecture, he expects to gain some knowledge, but in cases such as this, the audience can add nothing to what they already know of the subject.

A common fault in many lectures is the exhibition of too many slides. When, for instance,

**nearly 150 views**

are shown in about 90 or 100 minutes (which, as a rule, is quite long enough for a lecture alone), how is the audience to have time to examine each picture, and note the details of which the lecturer speaks? The lecturer may point out anything of interest, but it is most annoying to have the head of that person continually crossing the foreground of the picture. Another fault of which the lecturer is often guilty is that he requires to speak across the hall to the lanternist. When in the audience, I have found this most irritating, as no doubt have also many of my readers. If an efficient lanternist is not to be had, it is better that the lecturer should operate for himself than have to make remarks to the operator that can be heard by the audience.

It is a noticeable feature in the best exhibitions—that one of the silent method of slide changing, at the necessary moment, neither sooner nor later, without any evident signal or notice on the part of the lecturer, the picture is quickly (or in a manner not tiring to the eyes) changed, whilst the discourse is unbroken by that painful hesitation by the lecturer which so often takes place when a new picture is projected on the screen.

The above is what the lecturer requires to remedy in connection with the lecture. We shall now see what requires attention about the lanternist, lantern, and slides.

The lanternist's faults are mainly owing to carelessness. Improper adjustment of the light or disc, or the insertion of a picture upside down or wrong way round, are caused by want of attention or hurried manipulation of these parts.

**Ignorant Operators** sometimes set the jet hissing loudly in the vain attempt to produce a brighter disc, which, besides attracting the attention of the audience, annoys the speaker considerably, whose remarks are often drowned by the piercing sound.

The lanterns suitable for public use are now so perfect that, if properly managed, their faults are imperceptible. Although on many occasions double and triple lanterns are employed, much good work can be done by a single lantern, but I would advise those who use this form not to attempt or expect too much from their instruments. As far as showing efficiency goes, the single lantern is as useful as the bi-unial or triple, but if dissolving or effects are to be produced, it is much wiser, and in many cases absolutely necessary, to employ more than one lantern.

Now a word regarding slides suitable for exhibitions of this class. They should, of course, be as technically perfect as possible, and if pictorially so, all the better. In cases where possible, this latter quality should always be present. Even the eye not trained to know a good picture can tell when the view is pleasing or not, on account of its arrangement or pictorial composition.

The slides should be free from complication, and should be of a nature to be readily understood by the spectators. It should not be necessary for the lecturer to stop his discourse to point out something of interest in the slides, as there should only be one principal object in the view, and that should not require explanation. If any subordinate part of the picture deserves special attention, it is generally as well, if possible, to have a slide of that part alone, which can be shown after the principal view. Instead of having to explain the slides, the lecturer should have the slides explaining him. That really is the main object of having the lantern at lectures at all, namely, to let the audience have a better idea of the subject or place spoken of, by showing them pictures of the same. It too often seems that the slides are the principal attraction, and the lecturer a mere accessory to the entertainment, or, as it then becomes, show of slides. Theoretically, at a lecture pure and simple, no notice should be taken of the screen by the lecturer, which should illustrate, as the pictures of a book do the matter accompanying them, the lecturer's ideas and expressions.

In conclusion, let me suggest the following rules for the successful management of high-class lectures.

1. Be sure the lantern is firmly placed so as to avoid a shaky picture on the screen.
2. Be sure the disc will not be encroached upon by the heads of the audience.
3. Do not ask to be "favoured with darkness," but have the hall-keeper ready to turn the lights out at a secret signal from yourself.
4. Do not show any slide which requires an apology on account of bad photography, etc.
5. Although a few effects are good, too many should be avoided.
6. Do not attract attention by remarks to the operator during the lecture.
7. Never point yourself out in a picture.
8. Do not make too many jokes.
9. Do not show too many slides. (See MAGIC LANTERN JOURNAL for Jan., 1894, p. 15.)

* * *

## *Is Acetylene Poisonous? Precautions to be taken with this Gas.*

NOW that acetylene is becoming more common as an illuminant, a French scientist, Dr. N. Gréhant, considers it a work of utility to acquaint engineers and manufacturers with a number of experiments he made during last year. These researches are divided as follows :—

I. Physiological researches; poisonousness of this gas.

II. Complete combustion of acetylene; analysis of products of combustion.

III. Incomplete combustion of acetylene; production of oxide of carbon. Comparison with the incomplete products of combustion of lighting gas.

IV. Explosive mixtures of air and acetylene; explosive mixtures of air and lighting gas.

V. Brilliancy of acetylene flame; hygiene of the eye.

I. PHYSIOLOGICAL RESEARCHES. — Thirty years ago, the eminent chemist, Mr. Berthelot and Claude Bernard found that sparrows kept in an atmosphere mixed with some $\frac{1}{100}$ of pure acetylene did not seem to be affected in any marked way. In 1887, a Mr. Brociner, of Bucharest, maintained a thesis, at the Parisian School of Pharmacy, about the poisonousness of acetylene. Mr. Brociner studied the effects on a guinea-pig of 99 volumes of air and 1 of acetylene; 95 of air and 5 of acetylene; 90 of air and 10 of acetylene; and 50 of oxygen and

50 of acetylene. The conclusion was that acetylene is but very slightly poisonous. Two other experimenters, Messrs. Malvoz and Crismer, made similar experiments with results agreeing with those of Mr. Brociner, viz., acetylene is not poisonous. Mr. Brociner made the following deductions:—

A. Blood dissolves about $\frac{4}{5}$ of its volume of acetylene. B. Spectroscopic examination of blood mixed with acetylene reveals nothing special; this solution behaves exactly like normal oxygenated blood, and is similarly reduced with equal speed under the influence of hydrosulphate of ammonia. C. Under the influence of a vacuum, blood loses the acetylene; most of the gas is evolved cold, but to extract the totality the temperature must be raised to 60° C. Rodents, rabbits, and guinea-pigs resist the effects of oxide of carbon much better than carnivorous animals. Thus $\frac{1}{60}$ of oxide of carbon in the air kills a rabbit in 1 hour, and $\frac{1}{250}$ a dog. Some experiments were made to ascertain whether such is the case with acetylene, and a mixture of 40 per cent. of acetylene (as stated in our "Notes," in September Journal, page 138) killed a dog in 51 minutes, also a pigeon in 1 hour and 21 minutes. From which Dr. Gréhant concludes that acetylene is about as poisonous as carbonic acid, which kills animals in mixtures of 40 to 50 per cent., and much less poisonous than oxide of carbon, and consequently coal gas.

In practice, one will very rarely be exposed to inhale a mixture of air and acetylene at 30 to 40 per cent.; much slighter quantities, however, may be injurious by decreasing the relative proportion of oxygen in the air, exerting, perhaps, an unfavourable influence on normal exhalation of carbonic acid by the lungs.

It is chiefly by explosive mixtures which acetylene forms with air that this greatly carburetted gas may cause serious accidents. It is recommended that persons who have inhaled acetylene, quickly breathe pure air; thus it is rapidly removed from the organism. Acetylene is much less poisonous than oxide of carbon, and this fact can be demonstrated by an experiment which demonstrates at the same time that acetylene is dissolved by the blood and that the oxide of carbon is fixed. As an experiment, a mixture of 20 per cent. of acetylene, air and oxygen was composed, containing 28·8 per cent. of oxygen, and added $\frac{1}{500}$ of pure oxide of carbon to the mixture. After inhaling these gases for 30 minutes, a dog experimented with had respired 70 litres; the animal was then bled, and 20 cubic centimetres of the arterial blood was injected into a receiver maintained at 37° C.; after pumping out the air it was found to contain

| | | | | |
|---|---|---|---|---|
| Gas .. | 16·4 | per cent. | cubic | centimetres. |
| Potash .. | 6·4 | " | " | " |
| Carbonic acid | 10 | " | " | " |

The remaining gas, 6·4 cubic centimetres, was run into the gas indicator, and 8·6 cubic centimetres of acetylene were obtained per cent. of blood. In the same receiver, which contained bright red blood (oxycarbonated), was placed 40 cubic centimetres of acetic acid at 8° C., and the water boiled in a water bath.

| | | | |
|---|---|---|---|
| Gas obtained | 3·3 | cubic | centimetres |
| Potash .. | ·3 | " | " |

This gaseous residuum mixed with air gave in the indicator a reduction of 13·7 divisions, due to the presence of oxide of carbon, which corresponds to 1·8 cubic centimetres of this gas, the volume of which in 100 cubic centimetres of of blood was 9 cubic centimetres. Thus, in a case of poisoning by a mixture of acetylene and oxide of carbon it was possible to separate the first gas dissolved in the plasma of the blood from the second combined with hæmoglobin. Such different proportions as 20 per cent. of acetylene and 0·2 per cent. of oxide of carbon, which are as 100 to 1, introduced about the same volumes of the two gases into the blood; 8·6 cubic centimetres of acetylene and 9 of oxide of carbon.

II. COMPLETE COMBUSTION OF ACETYLENE. ANALYSIS OF PRODUCTS OF COMBUSTION.—To collect the products of combustion of acetylene, on a Manchester burner giving a very bright flame, a vertical metal cylinder connected with a cold water refrigerator and a gasometer was placed; all the products of combustion were conveyed with air into the gasometer, and 80 litres of gas were collected in two minutes. Analysis of the gases was made by baryta water, and showed 33·7 cubic centimetres of carbonic acid in 1,700 cubic centimetres of gas, or 1,468 cubic centimeters in two minutes. Two eudiometric analyses made gave for oxygen 18·59 and 18·57; the volume of oxygen consumed was equal to 1,786 cubic centimetres. The proportion $\frac{CO_2}{O}$ equals 0·82. Now we are aware that a volume of pure acetylene consumes 2·5 volumes of oxygen, and gives 2 volumes of carbonic acid; the proportion $\frac{CO_2}{O}$ equals 0·8. The numbers found indicate then the eudiometric character of acetylene in the Manchester burner.

Direct researches were made to ascertain whether combustion of acetylene engenders combustible gas. Into a glass bulb containing a spiral of platinum, maintained at a red heat by a battery of accumulators employed as a continuous indicator, was passed, during two hours, 1,300 cubic centimetres of gas collected and freed from carbonic acid, and in a baryta tube connected with the bulb there was only a scarcely perceptible ring of carbonate of baryta, indicating such a slight quantity of carbonic acid that analysis was impossible.

From these experiments it was concluded that the products of combustion of a Manchester burner with acetylene do not contain the least trace of combustible gas containing carbon.

III. Incomplete Combustion of Acetylene and Production of Oxide of Carbon.—Mr. Le Chatelier (*Comptes Rendus*, Dec. 30th, 1895), observed in the products of combustion of acetylene: carbonic acid, oxide of carbon, water steam, and hydrogen. Analysis of a dog's blood after the animal had inhaled the products of combustion mixed with air during 20 minutes revealed the presence of 23.2 cubic centimetres of oxide of carbon per 100 of blood. It is a considerable proportion, which explains the danger of death to the animal; therefore, when acetylene burns badly, it evolves a great deal of oxide of carbon. The same experiment was made with lighting gas; the dog died in a quarter of an hour, and the blood was almost completely oxycarbonated, containing 24 per cent. of oxide of carbon. Great care must be taken when employing acetylene or coal gas for heating to ascertain that the apparatus is not defective, as imperfect combustion of these gases would evolve a large and very dangerous amount of oxide of carbon.

IV. Explosive Mixtures of Air and Acetylene.—Explosive Mixtures of Air and Lighting Gas.—From experiments made it results that mixtures of air and acetylene explode with much greater violence than air and lighting gas. Great care must be taken to prevent escapes of acetylene gas. We must contradict a certain writer who said "Lighting gas becomes explosive when mixed with a small amount of air, whereas to make acetylene explosible the mixture is as considerable as it is impossible to realise." One must guard against the explosive mixtures which acetylene gives with air; that which gives "the most violent explosion is the mixture of 1 volume of acetylene and 9 of air." (*Comptes Rendus*, April 13th, 1896.)

V. Brilliancy of the Acetylene Flame. Hygiene of Sight.—Mr. Violle, Professor at the *Conservatoire des Arts et Métiers*, recently proposed employment of an acetylene burner as photometric standard. "The gas compressed in a holder issues under a pressure of 30 centimetres of water; it passes through a small conical opening conveying the air necessary for combustion, and burns in a burner of the Manchester type. The butterfly part of the flame, of uniform brilliancy, was determined by aid of the photometer and photography. The flame is surrounded with a double metal jacket which protects it against the surrounding air; the active part is limited by two diaphragms on either side, one, an iris-diaphragm, is worked by a graduated rod; the other may have openings of known diameter. Thus are obtained powers varying from 5 to 20 candle-power. The total flame represents 100 candles, and this power may be increased to 125 by extra pressure."

The brilliancy of the acetylene flame is such that if one gazes steadily for two minutes at the flame of a bat's-wing burner and then shut the eyes, a persistent image of great brightness is perceived on the retina, the duration of which is really a cause of anxiety. It thus appears that acetylene is too dazzling for offices or rooms. Inventors should study the best means to abate this brilliancy, so as to prevent possible injury to the eyes.

## *The Electric Light in the Optical Lantern.—No. IV.*

**By CECIL M. HEPWORTH.**

THE electric arc which gives us the brightest source of artificial light that we have applicable to the requirements of the optical lantern, is formed between two carbon points separated a small distance from one another, by the passage of electricity across that gap. We have now in this series of articles studied this effect pretty thoroughly, but very little notice has yet been taken of the cause. It would not do for a lanternist to undertake to give an exhibition with the limelight, no matter how perfect was his knowledge of the behaviour of oxygen and hydrogen in that connection, of jets and limes and all the other accessories of a limelight lantern if he knew nothing whatever of gas cylinders or bags, and was totally unacquainted with the function of the regulator. And before an electric lanternist can hope to conduct a show with anything like credit to himself and his apparatus, or, indeed, without mishaps of a more or less serious kind, he must know something of the nature, or at least of the behaviour under certain circumstances, of the electricity which he proposes to train to his service.

I have already said that the chief source of electricity of the kind that is employed to run an arc light is the dynamo, and that this engine may be likened to a pump whose function it is to force some of the electricity which is supposed to be all-pervading, away from one position where it leaves an emptiness, into another which thus has more than its normal quantity. So far the matter is easily understandable. It does not require any very acute perception to see that when you have too much of anything in one place which is anxious to get across to another where there is too little, and you offer to convey it across the space which it cannot pass without your help, you can justly

**demand a toll**

for so doing.

That is to say, the discontented "something" which is so anxious to transfer itself from the one place to the other, may be made to do a certain amount of work in its passage, and, naturally, that amount of work is proportional to the extent of its anxiety to make the change. For if it is only moderately anxious, and you say that you will give it the means of passing from place to place provided it will do a large amount of work, it will conclude that it is better off where it is, and nothing will come of your offer. Similarly, if the distance which it has to travel be very long, it has all this difficulty—the travelling expenses, as it were—to take into consideration, and it will only be worth its while to undertake a smaller quantity of work, by way of *quid pro quo*, than if the distance were shorter.

Those are the terms, then, on which you can make electricity do work for you. In return for a free passage in the direction in which it desires to go, it will be willing to perform a certain amount of work in direct proportion to the extent of discontent with its present quarters, which prompts it to make the removal, and inversely proportional to the length of the journey.

Now, unfortunately, we lanternists who have had no previous dealings with this curious customer that we call electricity, are naturally at a loss to know how to measure the extent of this discontent, or to arrive at a due estimate of the travelling expenses, so how are we to know what amount of work to demand as fair payment? We can realise that the "discontent" is a kind of "pressure," and we can measure the distance with a yard measure, but we do not know how to gauge this pressure, and what is the use of knowing how far it is from one point to another if we have no idea of the difficulties to be overcome in each yard?

The simplest way will be to seek an analogy in some other form of power or energy of which we are conversant, and our yard measure, and quart pot, and Bourdon pressure-gauge may come in useful after all.

Electricity, we are told, is

**incompressible,**

therefore air will not do for our analogue. If we take water we shall be all right upon that point, and perhaps it is the best that we can find, but we shall have to drop it before long, for it will not hold good through all the ramifications of the subject.

Let us pre-suppose the existence of a steam engine as the original source of energy, both in the case of water power and electricity, for here is a junction place from which they both may spring, and it will not be necessary to say that the coal is the source of the steam, or that the light and heat of the sun were responsible for the birth of the coal. I know you will accept the spirit of my poor explanations and not examine them so hypercritically as that, or I would never have attempted to set them down.

The steam engine works a pump whose duty it is to lift water from a cistern at a low level into another some considerable height above. The amount of water which it will raise in a given time is proportional to its strength divided by the height to which it has to carry the water. The result of the pumping is that we have what we call a "head" of water—"pressure" will be a better term for this particular purpose—and we therefore have a stored up power to accomplish a certain amount of work, which will be in direct proportion to the extent of this pressure and the amount of water which is stored. The pressure we measure as so many pounds on the square inch, and the water can be measured in quarts.

This definition and

**measurement of pressure**

remains the same if we abolish the upper cistern altogether, and carry the water direct from the pumps to the place where the work is ready for it to accomplish. This change is necessary in order to keep up the analogy to electrical power, for electricity cannot be stored—using the word in its proper acceptation.

In the same manner we may take the thickness of the stream of water as it comes from the pump as a means of estimating its quantity, instead of saying how many quart pots it would fill, and here, again, we bring the analogy nearer to the electrical standard, for it is not convenient to measure the capacity of electricity.

So we may say that a stream of water of a certain thickness, flowing at a certain pressure, will do an amount of work directly proportional to the sum of these two factors. Supposing that the stream was one inch in thickness and the pressure 100 pounds on the square inch, those two factors multiplied together represent a certain amount of power to do work. If the pressure were 200 pounds, or the stream twice the thickness, twice as much work could be accomplished, or if these doubled conditions existed together, they would represent energy of four times the original amount.

(*To be continued.*)

## *The Invention and Development of the Optical Lantern.*

By **EDWARD DUNMORE.**

### CHAPTER XI.

SLIDE painting, like painting any other picture, requires an artist to do it properly, but as we allude particularly to photographic transparencies, a knowledge of drawing is not so imperative as that of mixing colours. The colours themselves are transparent oil colours in collapsible tubes; selections of them are especially made up for this purpose, and sold in sets by artists' colourmen. Barnard, of Berners Street, W., has for many years made a speciality of these colours. Of course, any good transparent oil colour by any maker will be suitable. The most generally used colours are: Ivory black, neutral tint, burnt sienna, brown, pink, yellow lake, raw sienna, Italian pink, Chinese orange, rose madder, brown madder, purple madder, crimson lake, carmine, Indigo and Prussian blue, with a little magilp mastic varnish and light drying oil. A retouching desk is an advantage, but a piece of stout glass 10 inches by 12 inches framed, and with a couple of struts to support it at an angle, about twice as great as that of an ordinary writing desk, with a piece of white cardboard laid below it, will answer every purpose A flat wooden bar, sliding up and down on the face of the glass working in slots fixed to each side of the frame as a support to the slide being painted, is also a convenience; also a mask of opaque paper covering all the glass except an aperture for the slide being painted. Suppose we desire to **colour a landscape,** we squeeze out a little of the colours that are required on to a slab from the tubes in dabs, separated by about an inch or so, with a little magilp and varnish. The sky is first painted, using a little blue mixed to a suitable consistency with magilp; it should be rather stiff. After sparsely brushing it on, dab it with the end of the fingers until it becomes quite an even layer; a little rose madder may be introduced near the horizon, and over distant hills a little deeper blue with a little purple near the bottom. All this portion of the slide must be made even by dabbing, the drawing being already formed by the photograph itself. The next point is to introduce yellows and browns into the foreground to be followed by greens of various shades for the trees; then touches of bright local colours on objects in the foreground.

**The golden rule is** to use as little colour as possible on any part or parts of the subject, often photographs with merely a slight tint will look far better than if they are more deeply coloured. If clouds are required, being absent on the photograph, after putting on a flat tint for the sky, take a bit of rag twisted up to a point, and wipe off some of the colour where clouds are required. Cumulus and other elaborate forms of clouds require a skilled artist to put them in satisfactorily. If such prominent clouds already exist in the picture a very slight tint may be placed on the shadows, diluting the colours used with magilp and a little oil taken up on the point of the brush. When the painting is finished, place it out of the dust to dry. Japanners gold size is often used to mix the darker colours with, or white turpentine varnish for the more delicate ones. A very quickly drying varnish is difficult to work, and any varnish that will not dry perfectly transparent without heat should be avoided.

Very high lights may be removed with a needle or knife point used with extreme caution, leaving, of course, the bare gelatine. If the gelatine is cut into, the edges of the cut will often appear as defects. It rarely happens that a pure colour, as from the tube, is so suitable as one with an admixture of some other to take off its crudity and alter its tone. Foreground or sunset effects are the only places for very pronounced brilliant colours, but even here they should be kept well under control, and not too much of them. Blue, red, green, and yellow were almost the only colours used for lantern slides forty years ago; brilliant but exceedingly inartistic effects were the result, and a view of these slides at the present day is a lesson in

### what to avoid

in the way of colouring in every particular except brilliancy, although some allowance must be made, as the illuminants formerly in small private exhibitions were very inferior to those of the present time. Subdued colours had a very poor effect on the screen; the slides also being drawn by hand were crude in comparison with the photograph, which, by-the-bye, has undoubtedly had the effect of popularising the lantern.. Slides may be tinted with aniline colours, but they are somewhat fugitive, very good effects produced if a considerable breadth of tint is wanted as a seascape by moonlight. In preparing a slide of this kind, we first of all carefully go over the high lights with a little thin rubber solution, and then dip the slide into a solution of dark aniline blue, or it can be poured over the slide like collodion, the surplus being put back in the bottle. This can be repeated until sufficient depth is secured. A little difference in colour between the water and sky is made by passing a brush charged with green grey over the water. When it is all dry, a little friction with a pad moistened with benzine will remove the india-rubber from the high lights, which will be left white.

If aniline colours are applied with a brush, the precaution of moistening the film with spirit before beginning to colour will expedite matters. The light tints should be put on first as sky and water, then the foliage. There is always a disposition for these colours to spread, and when dry leave a deep-coloured edge. In order to avoid this have a bottle with spirit at hand; do not carry the colours quite to the edge of the object, but with a sable brush, lightly charged with plain spirit, soften it towards the edge.

### The aniline colours

should be dissolved in dilute spirit; spirit alone evaporates rather too rapidly and gives unnecessary trouble if working with a brush, although if the whole slide has to be tinted this is of no consequence. Always begin the middle of portion to be coloured, and work towards the edges, using little colour as possible, and availing yourself of any decided lines in the subject as the limitation of the tint. Practice will be necessary to do it well, but once get into the way of working and it will be easy enough.

I would advocate the use of sable brushes, and not camel's hair, for in these latter there is no elasticity, and hairs are very apt to come out; a broken hair on a lantern slide is a serious defect. The brushes should have a preliminary dip or two in turpentine, and rubbed dry on a clean rag to remove any loose or partially loose hairs before being put into use, and to cleanse them afterwards. Never put a brush away dirty; in fact, every precaution must be taken to preserve the integrity of the surface from dust and grit of all kinds, as an almost invisible speck will be unpleasantly evident on the screen. The slide should be examined by a magnifier of considerable power—a watchmaker's magnifying glass is a capital and convenient lens to use, sufficiently strong to detect any objectionable matter.

Very much the same rules apply in painting lantern slides as in other kinds of painting. Colours are more brilliant when

### glazed over

each other than by mixing them together in the first place. Supposing we desire a variety of greens in the foreground, we use several different single tints in the first place; then by glazing them over with yellow or brown we considerably add to the variety and harmonise the otherwise too crude colours, besides supplying a richness and purity of tint impossible were the pigments mixed the colour they were intended to remain at the beginning. Always before applying a second colour, see that the first laid on is thoroughly dried by heat; in case of four or five paintings each must be thoroughly dried before the next is applied. When the painting materials are done with, the brushes should be cleaned out with turpentine, and nicely wiped to a point and laid ready for the next job. The paint should be cleared off the slab or palette, and never left to dry on it. It is much more important to

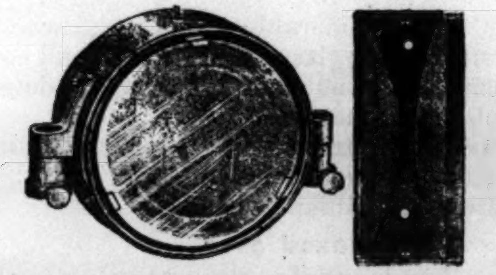
### keep things clean

for lantern slide painting than for painting of any other kind; tiny specks of old dry colour off the palette or in the brushes, or a broken hair, will give no end of trouble. If the paint is left to dry in the brush it will take a great deal of cleaning, to the detriment not only of the brush, but the painting. Good sable brushes will last a long time with careful usage, but are soon ruined for good work by neglect. Cleanliness is a golden rule, and applies to lantern slide painting with, if possible, more force than to anything else—save chemical experiments.

# NEW APPARATUS.

### CONDENSER CELL.

In the lanterns manufactured by Messrs. Colt & Co., of New York, the back condenser is supported on three spring clips, as shown in the illustration; this allows for expansion without injuring the lens. Electric lights being much used in connection with lanterns, the heat given off is much greater than when limelight is employed, hence the greater the expansion; and many condensers, which when cold in the circular cells, are loose, have been known to become cell-bound when the electric light has been used, and thus crack. This new device, however, obviates all chances of fracture.

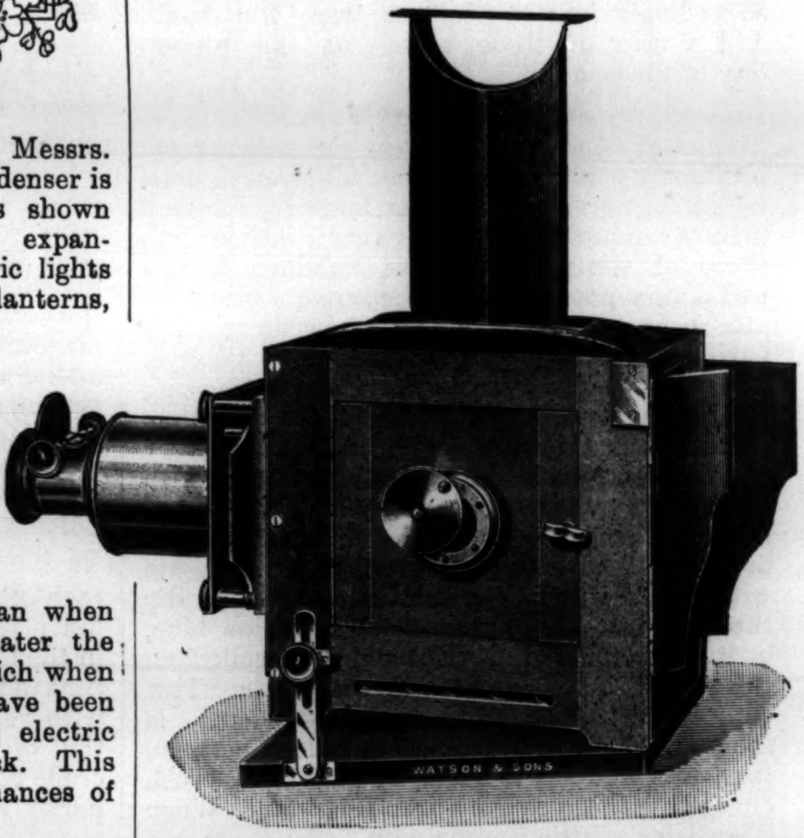


### UNIFIED SLIDE BINDER.

Some years ago a Birmingham firm introtroduced slide binders in one piece made of thin copper, but owing to the inconvenience of sharp edges occasioned by the want of the binder lying quite close to the glass they gradually fell into disuse. Messrs. Wood Bros., of Lord Street, Liverpool, are now issuing binders of the same shape, but in this instance they are made of the usual binding paper and gummed ready for use. The binders are of the shape shown in cut, and being without any jointing are easily applied, and when finished the slide presents a neat appearance, especially at the corners.

### UNIVERSITY EXTENSION LANTERN.

Adopting the best points suggested from various sources, Messrs. Watson & Sons, of High Holborn, have brought out a new lantern in which is provided a tilting base, and also a convenient form of end door, which unlike those in general use, hinges at the sides, thus forming two doors which meet in the centre. This style, for many reasons, is preferable to the old form of having the flap in one piece. This lantern is adapted for burners of any kind—oil, limelight, acetylene, or electric.



### EASTMAN'S X RAY PAPER.

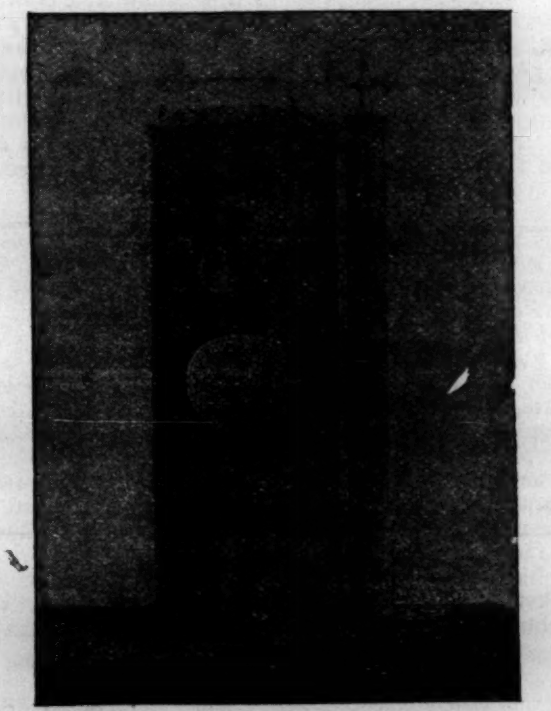
There being certain disadvantages connected with the use of glass plates, such as breakages, and want of their conforming to the part to be radiographed, the Eastman Photographic Materials Company, Limited, have introduced a paper which is admirably adapted for the purpose. With it positives are made direct; thus bones appear white, and as the paper is transparent to the X rays, several positives of any one object may be taken at one operation by merely placing the desired number of sheets together. This paper is extremely sensitive, and there being practically no limit to its size, as far as the sensitive surface is concerned, it would take in the whole length of the human body. The paper after having been exposed, is developed, for which purpose the following is recommended :—

| | |
|---|---|
| Amidol.................... | ½ ounce. |
| Sulphite of soda .......... | 1 ,, |
| Water .................... | 20 ounces. |

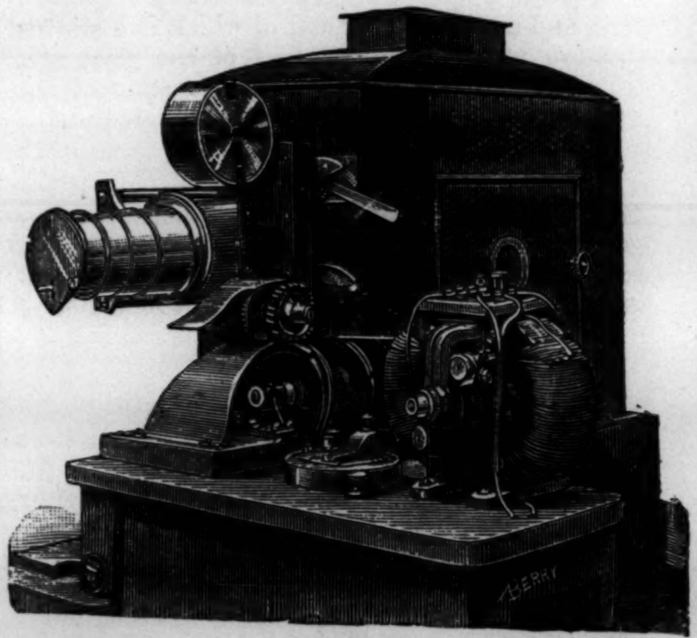
After development the prints are washed, and then placed in the ordinary fixing bath.

### BON ACCORD ACETYLENE GAS GENERATOR.

Bon Accord is the name given to the acetylene gas generator issued by Messrs. A. & J. Smith, of 23 & 25, St. Nicholas Street, Aberdeen. On reference to the illustration, it will be seen that it consists of a large and a small cylinder or tank. Into the larger one water is poured until it reaches within a few inches of the top, the inner bell or tank to which the handle is attached having first been removed. Inside the bell is suspended a holder for a supply of calcium carbide. This holder having been charged, is then placed inside the bell, and is conducted to its correct position by wire guides, when a half-turn suffices to retain it in position. This, then, is inserted in the water tank, and the outlet which is at the top of the small cylinder opened, so as to allow of the escape of air until the basket of carbide reaches the water, when up goes the container by reason of some gas having been generated. When first lighting up, the flame will be of a blueish character owing to the air present, but after this has escaped, the light from the flame becomes intense. The small cylinder, which is connected with the tank by means of a stand-pipe reaching above the level of the water, is charged with pumice stone in small lumps for further cooling and drying the gas, and at the foot of this small cylinder will be found a tap, by means of which water may periodically be removed from the small cylinder or condenser. In fitting up the burners for the lantern, Messrs. Smith provide two of different size, that next to the lantern condenser being 00000, and the other 0000. The apparatus is well and strongly made.



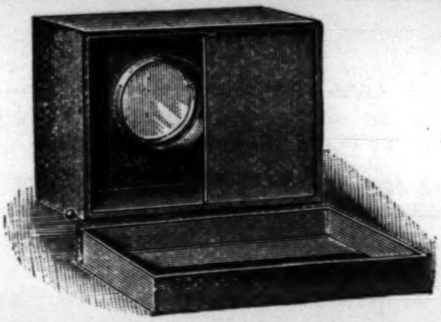
### KINEMATOGRAPH.



The firm that controls the kinematograph which is in daily use at the Westminster Aquarium, is the Anglo-Continental Phonograph Company of Brook Street, E.C. The general appearance of the machine will be seen from the illustration. The film is placed in the circular metal box above the projection lens, whence it passes between the condenser and lens on to the projections on the spocket wheel. For running the machine a 4-volts motor is employed ; a worm, on being revolved, engages with the spocket wheel, causing it to turn sufficiently to present a given portion of the film. When this worm enters on " a plain " it makes the film remain stationary a moment, during which time it is projected. This movement is repeated for each picture on the length of the film. For many months this machine has been in use at the Westminster Aquarium, with a 20-amp. Arc lamp, although for small discs lime-light will suffice. The same mechanism on being enclosed suffices to take negatives, and a 4-volts motor is used for running the machine either when taking negatives or projecting.

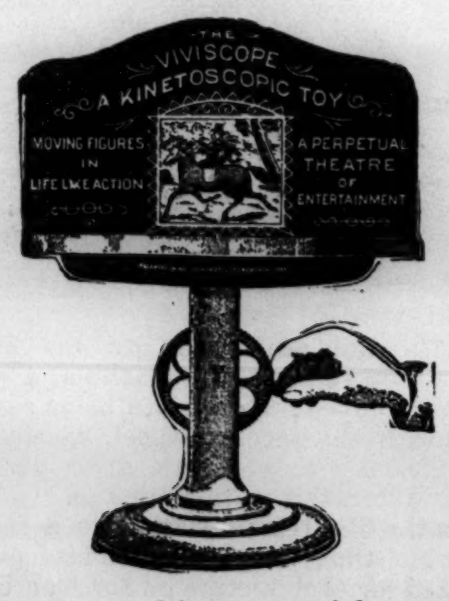
### DUPLICATOR.

Mr. W. Tylar, of Birmingham, is bringing out a cheap attachment whereby a person may be photographed in two different positions on one plate, or two people, say, sitting at opposite sides of a table, unbeknown to each other. The appliance consists of a box which fits on to the lens, and at the further end of which is a sliding division which shuts off half of the plate at a time. The exposure is made by means of the square wooden cap shown in the foreground.



### THE VIVISCOPE.

By the name "wheel of life," the younger generation will probably locate a well-known scientific toy. The viviscope is a new and improved form for bringing about the effect of moving figures, and forms a useful present for a child, and will afford excellent amusement at juvenile parties. Bands of coloured pictures are placed in position, with the pictures facing a species of proscenium, and the handle (as shown in illustration) is turned. Life-like motion is given to the subject, as seen either through the opening or at the sides. This scientific toy, which is dealt in by Mr. G. Fowler, 70, Great Saffron Hill, London, E.C., is having the large sale which it certainly deserves. It is inexpensive, and supplies no end of amusement.


THE
VIVISCOPE
A KINETOSCOPIC TOY
MOVING FIGURES IN LIFE LIKE ACTION
A PERPETUAL THEATRE OF ENTERTAINMENT

* * *

## Correspondence.

### ACETYLENE GAS BURNERS.

*To the Editor.*

Dear Sir,—I note in your January issue an article by Mr. H. J. Walker, dealing with acetylene. I cordially agree with what he says about this illuminant, both for lantern and domestic use I consider it far and away the best light—taken all round—that has yet been discovered for general use. Naturally, I do not pretend that in lantern work it can come any where near the limelight, to say nothing of the electric light for brilliancy, but it certainly is the most convenient for amateurs. I also note the difficulty Mr. W. experiences with the burners, I have found the same complaint against the same type of burner fittings; in fact, I did not pass the experimental stage with it. I not only found the difficulty he complains of, but also experienced a greater one in getting two burners exactly alike. I found that one—generally the front one—would roar, while the other did not give the light that it should have done, and if I turned down to stop the noise, the back one began to smoke in a very short time; this being most unsatisfactory I adopted the only course, which will, in my opinion, meet Mr. Walker's difficulty, viz., fitted each burner to a separate pipe, and each pipe with a separate tap. I now have no difficulty whatever, for though the pressure on the front burner is naturally the greater, it can be effectually controlled by its own tap. I shall be glad to give your correspondent any further information in my power.

I have had thoughts of putting this burner on the market, and also a dissolving arrangement as soon as I can find time to perfect them, provided of course that I can get anyone to take them up.

Yours sincerely,
R. MOSS.

### JUBILEE PROPOSAL.

*To the Editor.*

Sir,—As this will doubtless be a year of celebrations of all sorts and kinds, I venture to suggest to your readers that it would not be out of place if the many lanternists in the country were to make an humble attempt to commemorate the occasion by forming a set of slides illustrative of events and places connected with the life of our Queen and Country. I think such a set could be easily formed by your readers, and as easily despatched to some of the frontier townships and settlements of our distant colonies, where, passing from hand to hand, they would serve to remind the pioneers of our Empire that we at home recognise that their loyalty and their interest in the Old Country is no less than our own. Many of the larger towns of the Empire are as well served in the matter of slides, etc., as London itself: my idea was to arrange that the set suggested should rather travel about the outskirts of civilisation, where-ever a lantern and a few British subjects are found. I have no doubt that the clergy, schoolmasters, photographic societies, etc., would willingly lend their aid in arranging for the transmission of the slides to suitable localities in their own countries. If the plan suggested meets with approval, I do not think there would be any difficulty in collecting a first-rate set of slides, or in finding the small amount required for the expense of shipping it across seas.

It is not necessary to enter into details until the plan has been discussed by your readers, but if those who acquiesce in it will signify their approval by writing to me "care of Editor," and mentioning a suitable slide or two which they are able and willing to contribute, I will report on results in next Journal.

Any proposals, suggestions, etc. (especially from the Colonies themselves), will be highly valued.

I am, etc..

BOMBASTES TRIPLE.

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## QUICK ACTING CARRIER.

*To the Editor.*

Dear Sir,—The form of quick acting carrier suggested by Mr. G. R. Bryce in your last issue is almost identical with one I invented about three years ago, the chief difference being that I dispense with the cog-wheel motion, and use a much simpler method of revolving the carriers.

I have made a rough model and used it on several occasions with some degree of success. If Mr. Bryce should ever be in this neighbourhood and will give me a call, I shall be glad to let him see my apparatus.

I am, sir, yours truly.

H. L. KERDEL.

St. Mary's Cottage,
Old Woolwich Road,
Greenwich.

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## DRUNKENNESS—ON THE SCREEN.

*To the Editor.*

Dear Sir,—Might it not be of interest to the temperance cause, by means of quick exposures and the cinematograph, to publish a roll of pictures showing the effect of alcohol upon the system by starting with a person perfectly sober, and plying him with drink until he becomes incapable, meantime taking photographs all the time so as to show the results until the patient, in common parlance, "falls under the table." Such slides as this would, I think, do much good in showing people what beasts they may become by drink. If you know of any such set of slides, will you kindly let me know where I can obtain such, as I would then at once purchase one of the cinematographic apparatus, and include this subject in a series of lectures.

Yours, etc.,

BARTOS.

[Seeing that many exposures are made per second, and that the effects of which "Bartos" speaks would take some considerable time, it is likely that a film to embrace this subject would have to be several miles long. As a film about 70 feet long costs a few pounds, we wonder if "Bartos" would have sufficient ready cash to purchase one of the desired length, say twenty miles, for £7,000. We do not know where such may be obtained commercially, but if "Bartos" has money to spare, there will probably be little difficulty on his part in procuring a subject, if the requisite quantity of whisky is forthcoming.—Ed.]

—:o:—

## Editorial Table.

Letts & Co.'s Photographic Diary.—The 1897 diary issued by this firm is to hand. It contains useful photographic information compiled by Mr. E. J. Wall and other authorities. Space is provided for the full particulars of 360 exposures of negatives. A list of hotels, photographic dealers, and a list of cycle repairers in the principal towns in Great Britain is also given. The price is 1s.

Photographer's Miniature Annual. London: Carter & Co., Furnival Street. — It is surprising how much Mr. T. Bolas, the editor of this small annual, has managed to get into fifty-four pages, each page being only 2½ by 2 inches. The following is a copy of the index for this small book:—Anti-halation pads, apparatus, changing bag, bromide prints, calendars, camera supports, clearing solution, watch compass, copyrighting, cutting diamond, damp protection, dark-rooms, developing — enamelled prints, enlargement table, ferro-prussiate printing, ferrotypes, fixing, focusing, formulæ for hardening films, gummed paper, imitation plate marks, intensification, care of lenses, London photo societies, measures, metric system, mountants, notes, over-exposure, hints about patents, permits to photograph, platinotypes, poisons and antidotes, postal news, printing processes, reducing, retouching prints, thermometer scale, toning, notes for tourists, transparencies, tripods, varnish, weights and measures, work and progress during 1896.

Postage Stamp Portraits.—Mr. Tylar, of 42, High Street, Aston, Birmingham, is now prepared to execute orders for postage stamp size photographs, perforated and gummed in sheets of not less than forty-five from any cabinet or carte de visite. All orders will be supplied within ten days from receipt of order.

The Camera and the Pen.—By T. C. Hepworth, F.C.S. London and Bradford: Percy Lund, Humphries and Co., 6d.—This treats in a pleasant manner upon the methods of making line and half-tone printing blocks, for the illustration of periodicals and such-like. The book is divided into eleven chapters, and includes Pioneer process, Apparatus, Instantaneous pictures, and Development, Bleaching-out process, Half-tone process, Tint to line blocks, and the use of the lantern for sketching for photographs.

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On the 21st ult., before the Military Society, Dublin, Mr. P. S. Pilcher gave a lecture on "Aerial Machines." By a series of lantern slides he showed that a certain degree of success had been attained from time to time, but almost invariably some accident happened, which brought the experiment to an unsuccessful issue, but he hoped during this year to construct a machine with a 4 horse-power engine, which starting for a hill would maintain a horizontal flight for a considerable distance.

# Notes and Queries.

*E.C.*—The paper referred to is a small four-page one issued quarterly by J. H. McCollin & Co., lantern dealers, 631, Arch Street, Philadelphia, U.S.A.

*R.*—36 inches long, 6 inches wide, and 5 inches high.

*Alfred King.*—We cannot supply name and address of a contributor, but if you send under cover to us a stamped envelope addressed to W. H. S., we will fill in the name and address, and forward same. If, then, the writer of the article cares to communicate with you, all well and good.

*Explosion* (*India*).—It is perfectly safe, in our opinion, to use the fittings you state with the generator. We have had such in use for more than a year. An article in the January number would doubtless have been of interest to you.

*Constant Reader.*—(1) In the body of the lantern, close up to the condenser, a slot may be made in either side—bi-unials are usually provided with this—through which a long slip of glass tinted with various gradations is slowly passed. These slips are commercial, and may be obtained from any dealer at small cost. They are very useful for showing the effect from sunlight to moonlight. (2) A deep tone to represent church bells in the distance can be obtained by suspending a brass tube (length and thickness according to tone desired) by string, and striking it with a soft or muffled hammer.

*A. Williams.*—Paints may be obtained from Barnard & Son (see their advertisement on another page).

*Riley Bros.*—Sorry we are unable to supply any further information on the subject, but can refer you to the inventors, Messrs. Schott and Genosser, of Jena, Germany, from whom all particulars may be obtained. We learn however, that the glass is not very clear.

*S. White.*—We have referred the matter to Messrs. W. H. Smith & Son, and they say there seems no reason for the delay mentioned, as they obtain their supplies of this journal promptly.

*J. B. Janes.*—The form of generator has nothing whatever to do with the intensity of light given. We wrote giving the address where the light could be seen in operation.

*Ira Harris* (*Syria*).—We received your letter of December 28th enclosing stamped letters to a number of our advertisers, which were at once forwarded.

*Condenser.*—There seems to have been some delay on the part of Messrs. T. T. & H. in bringing out their special condenser, and, as far as we know, it is not yet perfect. It was their intention to have had it ready for the commencement of the season.

*Exhibitor* writes: "My father informs me that many years ago he remembers a specially interesting lantern slide being exhibited somewhere in Regent Street. It consisted of an arrow being shot from a bow in a particularly natural manner, so much so that the straining of the bow was observable. I have tried many dealers in lantern requisites, but cannot get any information where such can be obtained. One dealer said it was done after the style of the comic slipping slide with a mask covering up the arrow, but as this would then show the bow strained without an arrow to keep it so, I, as a last resource, make bold to write to you on the subject." *Ans.*—Had you applied to us in the first instance you would have saved yourself much trouble. The dealer who suggested the slipping slide is entirely wrong A slide such as you mention was shown some years ago at the Royal Polytechnic, Regent Street, and was not then commercial; on the contrary, was guarded as a secret. Eventually, it came into the possession of Mr. W. R. Hill, and through his kindness we were enabled not only to inspect it, but also obtained permission to publish working details. This we published with four drawings in this journal for August, 1893, and if you will get that number and follow instructions, you will possibly be able to make one for yourself; that is, of course, presuming you have the artistic ability. It is possible that Mr. Hill would undertake to make one; it is his invention.

*Lanternist.*—The last journal had just gone to press when your enquiry came. The pin might be made either of silver or platinum, as either will be of much higher melting point.

*T.P.O.*—We are glad to hear of the great assistance in connection with lantern matters rendered by your daughters. We have repeatedly given the instructions you require in this column. However, we repeat them among our Notes in this journal, as by that means they will find a place in our next index; this will enable them to be referred to at any future time without much trouble.

*Metal Turner.*—We do not answer questions unless the name and address be given us (in confidence).

*Walter Pindar.*—Kindly note for future guidance that our address from Chancery Lane, to the present one, was changed about a year ago; we mention this as you addressed your letter to Chancery Lane. You can get the style of slides you speak of from Bernard and Son, Berners Street, Oxford Street, W., or Theobald and Co., of Farringdon Street, but almost every small dealer now keeps them.

*J. A. Pitt.*—Thanks for the suggestion; we will try and see if we can adopt it in the near future.

*H. A. Sanders.*—Hardly the class of matter suitable for our columns; sorry we cannot use it.

*G. E. Lithgoe.*—We understand from the use of the particular jet that it is excellent in every respect. An article on this subject will appear as soon as a few experiments are completed.

*J. B. H.*—We know of nothing to remove the smell, but perhaps the addition of a little scent might disguise it somewhat.

*E. C. H.* (Victoria.)—(1) See the description of the apparatus in back numbers, the same appliance that projects the pictures can be used for taking the negatives. (2) The motion is not continuous in the camera, there being a short standstill of the film during exposure. (3) A shutter is used.

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MR. GEO. COOK, 7, Millburn Place, St. Andrews, N.B., writes, January 2nd:—"I ought to have written you before this date to **congratulate you on the issue of the 'Magic Lantern Almanac and Annual for 1897.'** It is in my opinion a **thoroughly reliable production** and should certainly be in the hands of every lanternist. There is to be found in its pages many **valuable hints** which will come in handy even to the operator of long experience. I have already found it so, and I have now been over twenty years at this hobby. **The articles are good, useful and well written,** and the advertisement pages will be found a boon and a blessing. I wish the Annual every success, as it undoubtedly deserves."